

Claim 1, part b, lines 6-12 (currently amended), please amend [said hollow cylindrically shaped body having a first internally threaded boss, or priming inlet, a second internally threaded boss, or collecting sump exit, a third internally threaded boss, or fuel inlet, a fourth internally threaded boss, or fuel outlet, a fifth internally threaded boss or heating connector means, said priming inlet being located on said apex of said top cap, said collecting sump exit being located on said bottom of said bottom cap, said fuel inlet, said fuel outlet, and said heating connector means being located on an exterior surface of said hollow cylindrically shaped body;] to

said hollow cylindrically shaped body having a priming inlet, a collecting sump exit, a fuel inlet, a fuel outlet, a heating connector means, said priming inlet being located on said apex of said top cap, said collecting sump exit being located on said bottom of said bottom cap, said fuel inlet, said fuel outlet, and said heating connector means being located on an exterior surface of said hollow cylindrically shaped body;

Claim 1, part c, line 13 (currently amended) please replace ‘... a priming means or...’ with –an–.

Claim 1, part e, line 19 (currently amended) please change ‘...having and inlet and an outlet, said inlet...’ to –...having a fuel transmission inlet and a fuel transmission outlet, said fuel transmission inlet...--

Claim 1, part f, line 24 (currently amended) please change ‘...said fuel exit;’ to read–a fuel outlet–.

Listing of Claims:

1. (Currently amended) A fuel purifier comprising:
 - a. a hollow cylindrically shaped body having a top cap and a bottom cap, the top cap and the bottom cap being attached to the hollow cylindrically shaped body, said top cap having an apex, and said bottom cap having a bottom;
 - b. said hollow cylindrically shaped body having a priming inlet, a collecting sump exit, a fuel inlet, a fuel outlet, a heating connector means, said priming inlet being located on said apex of said top cap, said collecting sump exit being located on said bottom of said bottom cap, said fuel inlet, said fuel outlet, and said heating connector means being located on an exterior surface of said hollow cylindrically shaped body;

- c. said priming inlet having an air bleed means threadably attached thereto, said collecting sump exit having a drainage valve means threadably attached thereto;
 - d. a bifurcating plate, said bifurcating plate being attached to an interior surface of said hollow cylindrically shaped body;
 - e. a fuel inlet, said fuel inlet communicating with a fuel transmission conduit, said fuel transmission conduit having a fuel transmission inlet and a fuel transmission outlet, said fuel transmission inlet communicating with said fuel inlet, said outlet of said fuel transmission conduit angularly directing fuel against said bifurcating plate, causing contaminant separation of the fuel;
 - f. said bifurcating plate creating a first chamber and a second chamber, said first chamber being located in the proximity of said fuel inlet, and said second chamber being located in the proximity of a fuel outlet;
 - g. a first separating means being positionally fixed towards a bottom of said hollow cylindrically shaped body and located in said second chamber of said hollow cylindrically shaped body, a second separating means being positionally fixed towards said bottom of said hollow cylindrically shaped body and being located in said first chamber of said hollow cylindrically shaped body;
 - h. a first separator plate, said first separator plate being attached to said interior surface of said hollow cylindrically shaped body and being located in said first chamber, said first separator plate creating an upper inlet portion and a lower inlet portion, said first separator plate additionally having holes defined therein allowing communication between said upper inlet portion and said lower inlet portion; and
 - i. an angled collecting plate, said angled collecting plate being located in said second chamber, said angled collecting plate being attached to said interior surface of said hollow cylindrically shaped body and said bifurcating plate, said angled collecting plate having an upper edge, said upper edge being positioned towards an upper portion of said bifurcating plate and directing fuel towards said outlet of said hollow cylindrically shaped body.
2. (Original) The fuel purifier of claim 1 wherein;
- a. said first separating means being a first perforated plate, said perforated plate having

- holes defined therein, said holes allowing fuel flow therethrough, and a means for contaminants to collect and eventually settle towards said bottom of said bottom cap and to be removed through said collecting sump exit; and
- b. said second separating means being a second perforated plate, said perforated plate having holes defined therein, said holes allowing fuel flow therethrough, and a means for contaminants to collect and eventually settle towards said bottom of said bottom cap and to be removed through said collecting sump exit.
3. (Original) The fuel purifier of claim 1 wherein said priming means is a stop cock.
4. (Original) The fuel purifier of claim 1 wherein said drainage valve means is a stop cock.
5. (Original) The fuel purifier of claim 2 wherein said holes having a diametrical formula that is a ratio of the tubular body diameter, said ratio being between four percent and seven and one half percent.

REMARKS

1. 35 U.S.C. 112 claim rejection

Claim 1 stands rejected under 35 U.S.C. 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter that the applicant regards as his invention. Specifically, Claim 1 part e "...a fuel inlet, said fuel inlet communicating with a fuel transmission conduit, said fuel transmission conduit having an outlet and an inlet, said inlet communicating with said fuel inlet, said outlet of said fuel transmission conduit angularly directing fuel against said bifurcating plate, causing contaminant separation of the fuel". The Examiner states that it is unclear as to whether the inlet and outlet to the body or the inlet and outlet to the fuel transmission conduit is being claimed.

The Examiner also states that the limitation "fuel exit" in part f, line 3 has insufficient antecedent basis for this limitation in the claim.

2. 35 U.S.C. 102 claim rejections

The Examiner has rejected Claims 1, 3 and 4 under 35 U.S.C. 102(b) as being anticipated

by Coale (U.S. Patent No. 5,534,138).

A. In **Claim 1, part b**, the Examiner states that it is unclear whether applicant wanted to claim a first internally threaded boss or priming inlet, a second internally threaded boss or collecting sump exit, a third internally threaded boss or fuel inlet, a fourth internally threaded boss or fuel outlet, a fifth internally threaded boss or heating connector means. The Examiner deemed a first, second, third, fourth, and fifth internally threaded boss(es) were used for examination purposed.

B. In **Claim 1, part c** the Examiner states that it is unclear if the priming inlet and the collecting sump exit were actually claim as discussed above.

C. In **Claim 1**, the Examiner states that Coale teaches a fuel purifier with an outlet of a fuel transmission conduit angularly directing fuel against a bifurcating plate, causing contaminant separation of the fuel.

D. In **Claim 3**, the Examiner says that Coale teaches a fuel purifier wherein said priming means is a stop cock as shown in Figure 5.

E. In **Claim 4**, the Examiner claims that Coale teaches a fuel purifier wherein said drainage valve means is a stop cock as shown in Figure 5.

3. Claim rejections under 35 U.S.C. 103 (a)

The Examiner has rejected Claims 1, 2 and 5 under 35 U.S.C. 103 (a) over Yeh (U.S. Patent No. 5,866,000) in view of Coale (U.S. Patent No. 5,534,138).

A. In **Claim 1**, the Examiner states that in the Yeh patent that the angled collecting plate is an inherent feature of Yeh because the randomly aligned fibers of the outer layers and loosely packed vertically aligned fibers in Yeh must have a support plate, baffle, screen or netting to maintain the structure of the fibers. The Examiner further states that Yeh is silent to the specific connections the bosses use but that in the light of Coale, it would be obvious to one skilled in the art to include internal threads for connecting the inlet, outlet and sump conduits.

B. In **Claim 2**, the Examiner says that a first and second separating means are a first and a second perforated plate, said first and said second perforated plate each having holes defined therein allowing fuel flow therethrough and each separating means having means for contaminants to collect and to eventually be removed through a collecting sump exit.

C. In Claim 5, the Examiner states that Yeh and Coale each teach the fuel purifier with a first and a second separating means comprising a perforated plate with holes. The Examiner notes that both Yeh and Coale are silent as to the exact dimensions of the holes in the perforated plates, i.e. specifically having a diametrical formula, as in Applicant's formula, that is a ratio of the tubular body diameter of four percent to seven and one half percent. The Examiner believes that both Yeh and Coale are separating liquid/liquid mixtures in a fashion similar to the Applicant's method and that therefore it would have been obvious to one skilled in the art to fabricate perforated plates with holes meeting Applicant's diametrical formula mentioned above for the Yeh and Coal inventions to be functional in the same liquid/liquid separation.

4. Examiner's Conclusion

Although there is a heading for "Conclusion", there does not appear to be any conclusion given by the Examiner in the Office Action.

DISCUSSION

1. 35 U.S.C. 112 claim rejection

Claim 1, part e has been amended to specify which type of inlet and outlet are being claimed, i.e. fuel transmission inlet and fuel transmission outlet.

Also, in Claim 1, part f, line 3, it has been amended to change "...said fuel exit..." to "... a fuel exit...". It is believed that this amendment overcomes the Examiner's objection to insufficient antecedent basis for this limitation in the claim.

It is believed by the Applicant that these amendments are sufficient to overcome the Examiner's 35 U.S.C. 112 claim rejection.

2. 35 U.S.C. 102 claim rejections

In the field of diesel fuel/water emulsions that are commonly found in raw diesel fuel, there are several techniques to break up the emulsions and purify the fuel. These include, but are not limited to: centrifugation of the mixture; eluting the fuel through a semipermeable baffle so that the slower migrating water component is separated from the diesel component; utilizing a surfactant that

allows the diesel and water to become miscible with each other; or utilizing passive separating means such as perforated separating plates or wire meshes to effect separation of the diesel component from the water component (as in the current invention).

Claim 1, part b has been amended to clarify the purpose of each inlet and outlet to the fuel purifier (supra, under Amendments).

The Examiner uses the Coale patent (U. S. Patent No. 5,534,138) as the basis for a 35 U.S.C. 102 (b) rejection, apparently based in part on the external appearance of the devices being similar, particularly with respect to Claim 1, including parts b and c. However, internally, the Coale invention relies upon sufficient circular flow of the diesel/water mixture to create an environment emulating the action of a centrifuge.

The current invention utilizes a different principle at it's point of novelty. The Lindow invention utilizes a perforated separating plate having a multiplicity of holes in the plate to cause a breakup of the diesel/water emulsion, thus purifying the raw diesel fuel passing through the fuel purifier.

It is this same novelty that distinguishes the Lindow application from the Coale patent. Although they may superficially appear similar, they are in fact entirely different in the way they effect separation of the diesel fuel.

As to claims 3 and 4, the Coale patent, Figure 5 is a flow diagram wherein the structures at the top and bottom of the separator in Figure 5 are neither labelled nor defined as to their nature in the Coale detailed description except as "...drain means(50)." and "...fuel outlet (30)" (Column 5, line 29 of the Coale patent).

3. Claim rejections under 35 U.S.C. 103 (a)

The Examiner has rejected Claims 1, 2 and 5 under 35 U.S.C. 103(a) as being unpatentable over Yeh (U.S. Patent No. 5,866,000) in view of Coale (U.S. Patent No. 5,534,138).

As mentioned above (supra), the Coale invention relies upon sufficient circular flow of the diesel/water mixture to create an environment emulating the action of a centrifuge, which is inherently different from the separator plate methodology used in the current invention.

The Examiner points out that Yeh teaches a first separating means (18) being a first perforated plate with holes defined therein allowing fuel flow therethrough and for contaminants to

collect and eventually settle towards the bottom of the bottom cap (32) and a second perforated plate (30) with holes functioning in a manner similar to the first perforated plate.

In the Yeh detailed description (column 6, lines 18-23) the first perforated plate's (18) purpose is to provide an outlet for separated fluid from the liquid particles. The second perforated plate's (30) purpose is as a stabilizer disk (30) fixed in a horizontal plane about a pipe (22) to allow the fluid and matter unrestricted flow within the separator (10) (column 6, lines 34-41). The Yeh invention uses a different means, i.e. randomly packed fibers, to cause particles to coalesce into a film and effect separation of liquid-liquid mixtures (column 6, lines 64-67 to column 7, lines 1-9) than does the current invention.

The Yeh invention also relies upon the diesel/water mixture to enter the device at an angle, causing a high velocity, circular motion in a spiral channel, which causes a separation of water from diesel fuel within the randomly packed fibers. The current invention uses the perforated plates and not randomly packed fibers to cause the diesel fuel and the water to separate.

In the current application, the Applicant is using the first perforated plate (50) and a second perforated plate (54) to actually cause water and sediments held in suspension in the fuel to coalesce out (Detailed description, page 8, lines 22-23) rather than packed fibrous material, as in Yeh. Neither Coale nor Yeh teach utilizing their perforated plates for this purpose.

As to claim 5, a careful reading of either Coale or Yeh do not teach that the exact dimensions of the holes in there perforated plates does follow a diametrical formula, as in the current invention, of between 4 percent and 7 ½ percent. Since the perforated plates in either Coale or Yeh are being utilized as either supports or fluid conduits and are not being used to break up the water/fuel emulsions, it would not have been obvious to either Coale or Yeh to utilize a diametrical formula that would break up emulsions of diesel fuel and water, such as are used in the current invention. And, indeed, the Examiner admits that both Coale and Yeh are silent to the exact dimensions of the holes in the perforated plates (page 9, lines 2-3). It becomes obvious that the perforated plates in Coale and Yeh are only used to allow the water to drain to the bottom of the filter.

CONCLUSION

In summary, we believe that the Examiner has failed to state a prima facie case of obviousness for the current invention.

This rejection is believed to be overcome for the reasons stated above.

In view of the above, it is submitted that the claims are in condition for allowance. Reconsideration and withdrawal of the rejections are requested. Allowance of claims 1-5 at an early date is solicited.

Respectfully submitted,



Lewis M. Brande.